United States Patent [19]

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[54] **MULTIFOCAL PHASE PLACE**

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[*] Notice: The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

[21] Appl. No.: **142,005**

[22] Filed: **Apr. 21, 1980**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 970,751, Dec. 18, 1978, Pat. No. 4,210,391.

[51] **Int. Cl.**[3] **G02B 3/08;** G02B 17/00; G02C 7/04; G02C 7/06

[52] **U.S. Cl.** ..... **351/161;** 350/162 Z P; 350/444; 350/452; 351/168

[58] **Field of Search** ..... 351/160 R, 160 H, 161, 351/168; 350/162 Z P, 452, 444

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,004,470 10/1961 Rühle 350/452

OTHER PUBLICATIONS

Zieglar, J. F.; "Fabrication or Correction of Optical Lenses," *IBM Technical Disclosure Bulletin;* vol. 12 No. 10; Mar. 1970; pp. 1573–1575.

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[57] **ABSTRACT**

A phase plate construction suitable for use in optical systems with multifocal requirements. It is designed as a phase plate in order to provide sharp and clear focii with bright images. This is accomplished by adjusting the Fresnel echelettes and the zone plate spacings, of the phase plate, such that the Fresnel lens focii coincide with particular zone plate focii.

12 Claims, 7 Drawing Figures